

REMARKS

The applicants appreciate the Examiner's thorough examination of the application and requests reexamination and reconsideration of the application in view of the preceding amendments and the following remarks.

The applicant's invention is directed to a scanning plasma reactor for exciting or ionizing reactant gases with UV radiation at a substrate surface comprising a beam forming module to transform a UV radiation source raw output into a rectangular beam, a gas injection module to deliver at least one reactant gas to the substrate surface, a reaction chamber with a UV window through which said beam forming module projects said rectangular beam, a vacuum chuck for holding a substrate; and a gas exhaust module inside said chamber to remove reaction by-products and unreacted reactant gas from the substrate surface, wherein said gas injection module and said gas exhaust module are in close proximity to said rectangular beam, and wherein said rectangular beam, said gas injection module and said gas exhaust module are movable relative to the substrate surface.

In the prior Office Action, the Examiner rejects claims 1, 7-13, 17-20 and 24-29 under 35 USC §103(a) as being unpatentable over U.S. Patent No. 6,090,458 to *Murakami* in view of U.S. Patent No. 5,174,826 to *Mannava et al.* The Examiner states that *Murakami* fails to specifically teach that the gas exhaust module is inside the reaction chamber and at least a second fluid or vapor to the substrate surface and that such features are taught by *Mannava*. Further, the Examiner states that *Mannava* teaches a processing apparatus having a gas exhaust module 48 located inside the reaction chamber, and that it would have been obvious to one of ordinary skill in the art to provide the exhaust module of *Murakami* inside the chamber as taught by *Mannava*.

In the Office Action, the Examiner states that *Mannava* shows that the exhaust module is located in the chamber 22, and cites to Col. 1, lines 56-60 and Col. 4, lines 12-15 and lines 33-

40. However, the exhaust module 48 of *Mannava* is not inside the reaction chamber of *Mannava* as claimed by the applicant, but is actually disposed in the wall of conical reaction product extraction nozzle 44. One feature of the applicant's claims is that the exhaust module is located within the reaction chamber where the reactant gas and radiation source react. *Mannava* clearly shows that the reaction chamber where the reactive gas and laser beam reaction is reaction chamber 22. See Fig. 2 and Col. 4, lines 41-63 of *Mannava*. Indeed, *Mannava* specifically states that "the laser beam 42 passes through the window 32, along the cylindrical axis of the reaction chamber 22, and out of the reaction chamber 22 through the opening 46 of the nozzle 44." Col. 4, lines 19-22 of *Mannava* (emphasis added). *Mannava* clearly shows that the extraction nozzle 44 is not within the reaction chamber 22, and thus, that the vacuum line 48 is not inside the reaction chamber 22. This is in contrast to the applicant's claimed invention which includes a gas exhaust module inside the reaction chamber.

Accordingly, as *Mannava* fails to disclose the gas exhaust module inside the reaction chamber as claimed by the applicant, the combination of *Mannava* and *Murakami* fails to include each and every feature of the applicant's claimed invention. Therefore, the applicant submits that the claims of the subject application are patentable over the combination of references.

The Examiner rejects claims 2 and 4-6 under 35 U.S.C. §103(a) as being unpatentable over *Murakami* in view of *Mannava* and further in view of U.S. Patent No. 5,814,156 to *Elliot et al.*, and claim 3 as being unpatentable over *Murakami* in view of *Mannava* and further in view of U.S. Patent No. 4,264,330 to Schmidt *et al.* However, independent claim 1 is patentable for the above reasons, and dependent claims 2-6 are patentable for at least those reasons. Accordingly, claims 2-6 are patentable over the combination of references.

The Examiner rejects claim 14 under 35 U.S.C. §103(a) as being unpatentable over *Murakami* in view of *Mannava* and further in view of U.S. Patent No. 5,002,631 to *Giapis et al.*


However, independent claim 1 is patentable for the above reasons, and dependent claim 14 is patentable for at least those reasons. Accordingly, claim 14 is patentable over the combination of references.

The Examiner rejects claim 23 under 35 U.S.C. §103(a) as being unpatentable over *Murakami* in view of *Mannava* and further in view of U.S. Patent No. 6,374,770 to *Lee et al.* However, independent claim 1 is patentable for the above reasons, and dependent claim 23 is patentable for at least those reasons. Accordingly, claim 23 is patentable over the combination of references.

Each of the Examiner's rejections has been addressed or traversed. Accordingly, it is respectfully submitted that the application is in condition for allowance. Early and favorable action is respectfully requested.

If for any reason this Response is found to be incomplete, or if at any time it appears that a telephone conference with counsel would help advance prosecution, please telephone the undersigned or his associates, collect in Waltham, Massachusetts, (781)890-5678.

Respectfully submitted,



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